

Atmospheric Processes and the Water Cycle (Earth and Space Science Unifying Concept A)

Earth systems have internal and external sources of energy, both of which create heat. Driven by sunlight and Earth's internal heat, a variety of cycles connect and continually circulate energy and material through the components of the earth systems.

By the end of the grade band:		By the end of the grade band, students know and are able to do everything required in earlier grades and:		By the end of grade band, students know and are able to do everything required in earlier grades and:		By the end of grade band, students know and are able to do everything required in earlier grades and:		
Grades K - 2		Grades 3 - 5		Grades 6 - 8		Grades 9 - 12		
E.2.A	Students understand that changes in weather often involve water changing from one state to another.	E.5.A	Students understand the water cycle's relationship to weather.	E.8.A	Students understand the relationship between the Earth's atmosphere, topography, weather and climate.	E.12.A	Students understand heat and energy transfer in and out of the atmosphere and influence weather and climate.	
E.2.A.1	Students know the Sun is a source of heat and light. E/S	E.5.A.1	Students know the Sun is the main source of energy for planet Earth. E/S	E.8.A.1	Students know seasons are caused by variations in the amounts of the Sun's energy reaching Earth's surface due to the planet's axial tilt. E/S	E.12.A.1	Students know the Sun is the major source of Earth's energy, and provides the energy driving Earth's weather and climate. E/S	Sun's Energy
E.2.A.2	Students know water on Earth can be a liquid (rain) or a solid (snow and ice), and can go back and forth from one form to the other. E/S	E.5.A.2	Students know the processes of the water cycle, including the role of the Sun. E/S	E.8.A.2	Students know how the processes involved in the water cycle affect climatic patterns. E/S			
		E.5.A.3	Students know most of Earth's surface is covered with fresh or salt water. W/L	E.8.A.3	Students know the properties that make water an essential component of the earth system. E/S			
		E.5.A.4	Students know the role of water in many phenomena related to weather (e.g., thunderstorms, snowstorms, flooding, drought). E/S	E.8.A.4	Students understand the composition of Earth's atmosphere, emphasizing the role of the atmosphere in Earth's weather and climate. I/S	E.12.A.2	Students know the composition of Earth's atmosphere has changed in the past and is changing today. I/S	
E.2.A.3	Students know weather changes from day to day and seasonally. I/S	E.5.A.5	Students know air is a substance that surrounds us, takes up space, and moves around us as wind. I/S	E.8.A.5	Students know the difference between local weather and regional climate. I/S	E.12.A.3	Students understand the role of the atmosphere in Earth's greenhouse effect. E/S	Weather
						E.12.A.4	Students know convection and radiation play important roles in moving heat energy in the Earth system. E/S	
E.2.A.4	Students know weather can be described by measurable quantities such as temperature, wind direction and speed, and precipitation. I/L			E.8.A.6	Students know topography and patterns of global and local atmospheric movement influence local weather which occurs primarily in the lower atmosphere. E/S	E.12.A.5	Students know Earth's rotation affects winds and ocean currents. I/S	